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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/743,540

12/23/2003

Hideki Sunaga

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01/04/2005

FOLEY AND LARDNER

SUITE 500

3000 K STREET NW

WASHINGTON, DC 20007

EXAMINER

HIRUY, ELIAS

ART UNIT

PAPER NUMBER

2837

DATE MAILED: 01/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/743,540	SUNAGA ET AL.	
	Examiner	Art Unit	
	Elias B. Hiruy	2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

The specification is replete with terms that are not clear, concise, and exact. The disclosure contains several minor grammatical problem and wrong word usages.

For instance,

- Page 2, paragraph 1 appears to be a direct translation from a foreign statement. The idea that the applicant is trying to convey is not clear.
- Wrong word usage such as “fun” which was meant to say “fan” (page 4 paragraph 5 lines 18, 19, and 21) is repeatedly used. Also, the examiner is not clear if the usage of the word “worm” in page 6 line 4 and 5 was intentional or a mistake.

The above-mentioned problems are only part of the many grammatical and

wrong word usage that the examiner quoted. Applicant needs to further check the specification thoroughly to make sure that additional problems are corrected appropriately.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The usage of the phrase "the driving control device" as the apparatus and then later as different parts in the apparatus fails to describe and communicate the invention clearly and concisely thereby rendering the claim indefinite. In fact, this repeated usage of the phrase "the driving control device" relays that there is more than one driving control device. Since neither the specification nor the drawings support this fact, the claim needs to be rewritten in a form where this ambiguity can be cleared. In this prosecution, it is understood by the examiner that the invention is a driving control device for an actuator that comprises the following basic components:

An electric motor ...

A control circuit/device to control the rotation of said electric motor by controlling the driving circuit/device

Wherein said control circuit/device or circuit includes an H bridge...

Wherein said control circuit/device conducts to activate or ...

The prosecution in this office action has continued based upon the above presumption.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 2837

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 1 and 2 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Taketomi et al US 6,288,508 B1.

Taketomi et al teaches about an apparatus that meets the limitations introduced in claim 1 and 2. Taketomi et al apparatus consists a control circuit/device (CPU 23, Fig. 1), a drive circuit (FET drive circuit 34 and FET1-FET4, Fig. 1), an actuator (Column 6, line 22-26), and an electric motor (shunt type motor 11, Fig. 1). The apparatus control circuit/device controls the driving circuit, which is arranged as an H bridge, using pulse width modulation (See Fig. 1). Since both the top and bottom part of the semi-conductors are controlled by a PWM signal, it meets the limitation of claim 1 which states that the bottom portion of the H bridge circuit is being controlled by a PWM signal. Further, the electric motor can be run in the reverse as well as in the forward direction (Column 2, line 39-61) by turning a set of transistor and applying PWM, and this action is fully controlled by the control circuit/device. Thus, the limitations in claim 1 are fully anticipated by Taketomi et al.

The limitation of claim 2 here in this application falls under the teaching of Taketomi et al since the regenerative process (Column 3, line 66-67 and Column 4, line 1-22) includes applying pwm signal to the lower arm of the H Bridge.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

Art Unit: 2837

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taketomi et al US 6,288,508 B1 as applied to claim 1 above, and further in view of Coles et al US 6,124,688.

In paragraph 3 above, it is shown how claim 1 limitations were clearly anticipated by Taketomi et al teaching.

Taketomi et al teaching, however, fails to disclose how the control system could switch two different driving modes.

Coles et al discloses an apparatus and a method that has two different driving modes the complimentary modulation (i.e. driving pulse) (Column 3, lines 38-46) and the bottom only modulation (i.e. PWM signal applied to the lower arm of the bridge circuit)(Column 3, lines 47-53). The control system is able to select (Column 3, lines 28-36) one of the two methods depending on different conditions. Thus, the teaching of claim 3 in this application fully falls under the Coles et al disclosure.

Regarding claim 5, Coles et al teaches how the control system applies the complimentary modulation when there is higher demand for torque, and the bottom only modulation is applied when the motor speed is high enough (Column 3, lines 57-63). When the torque requirement is increased, the control method of Coles et al selects the complimentary modulation in like manner of claim 5 of this application.

Accordingly, It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the method and apparatus of Coles et al into Taketomi et al invention. The motivation being that using the two modes and

selecting one of the two modes to best fit the current situation will enhance the accuracy of the motor torque control irrespective of rotor speed, and it further minimizes the motor torque ripple and acoustic noise from the motor.

Allowable Subject Matter

5. Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Please refer to the PTO-892 form enclosed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elias B. Hiruy whose telephone number is 571-272-6105. The examiner can normally be reached on 7AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on (571) 72-2107. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you

Application/Control Number: 10/743,540

Page 7

Art Unit: 2837

have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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